

North Central University – NCU HCM University of Industry - HUI

BBA Articulation Program

**PRODUCTION AND TECHNOLOGY
IN CASHEW EXPORT ACTIVITY**

Subject BUSINESS MATHEMATICS

Code BM . SM . 08 . F1

SEMINAR

HCMC - 2008

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HCMC - 2008

ABSTRACT

We have performed a trading research in cashew exportation for this seminar in order to apply the knowledge of economics and business mathematics. By using software Maple, Curve Expert and Online Financial Tools, we can solve the problems in this business plan effectually . Beginning from the requirement of this seminar, we have gathered experiences about information research, connecting with companies and customers. We also have a chance to apply our understanding into the real activities to become the good managers . Creating and running a successful business is both an art and a science. Failure to plan your business is the same as the failure of business . Even with the best-laid plans there are no guarantees of ultimate success but many obstacles and hurdles can be avoided with proper planning and research. The following content is not complete but we hope it will give you the basic concepts to build a business plan in the future .

ACKNOWLEDGMENTS

We would like to thank our professor , Co Hong Tran MSc Mathematics Mechanics and his assistant for their guidance and support throughout the course of this research.

Thanks also to our colleagues at the North Central University – Ho Chi Minh University of industry , our friends and various organizations and departments at Binh Phuoc province especially , for making our time here a great experience.

Finally, we would like to express our sincere gratitude to our parents, teachers and friends across the globe for continuous support and encouragement .

We are grateful to many people for their help and encouragement on this seminar . As well as , thanks to lady and gentleman who have provided data and advices and management experiences. We desire to make as possible as a perfect business plan . However, in the studies and report process we can not avoid mistakes unintentionally , so we hope to receive ideas , understanding and contribution from everyone .

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1. Introduction .

1.1 Overview .

In the recent years, agriculture product export and produce filed in our country is growing very quickly. To bring a such great profit , cashew export and production has big market share and a remarkable weight . The cashew price in the world has increase in the early 2008 with supply-demand balance context. Investors begin their concern in purchasing cashew while raw material in the domestic market is very plentiful and cheap. The following chart (figure 1.1) shows us the increasing of cashew price in several months from the market demand .

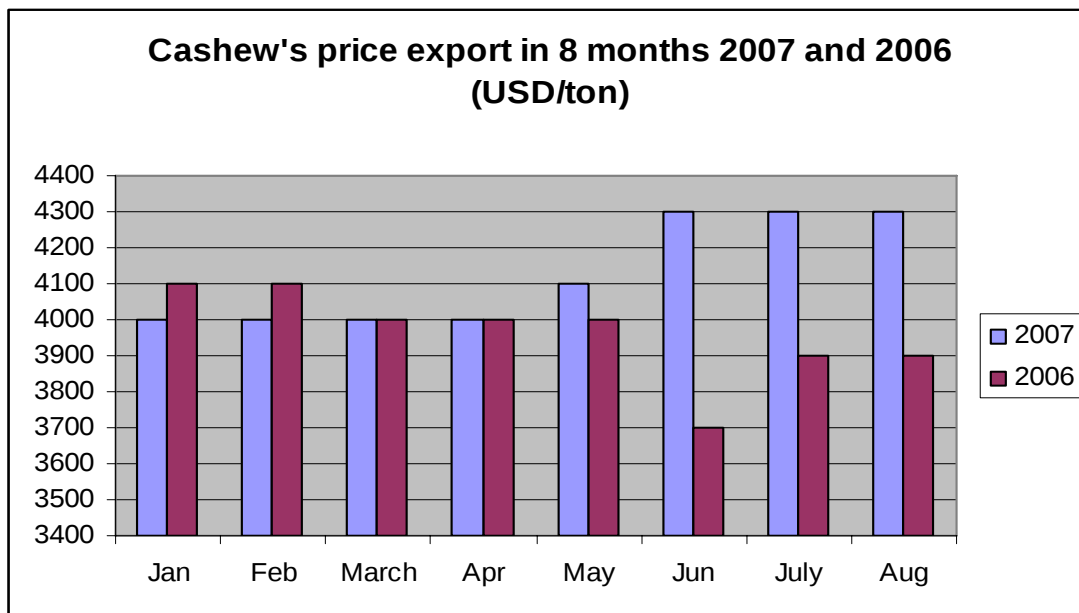


Figure 1.1 *The increasing of cashew price*

Nowadays , the cashew export activity of Vietnam takes the first position in the world and the average output of cashew to export is increasing to 155,000 tons per year with the evaluation of 640 million VND (see table 1.1) . According to the trading forecast , the world market demand rises up to 4% or higher annually . Cashew exportation of Vietnam is raising both the quantity and turnover. Vietnam has supplied most of the cashew products to 40 countries and other areas in the world.

Depending on the data of Vietnam Cashew Export Association in the early eight months of 2007, we have the following review :

- America : 40% of market share for export.
- China : 25% of market share for export.
- Others : Japan , Russia and Middle East area . See figure 1.2a and figure 1.2b .

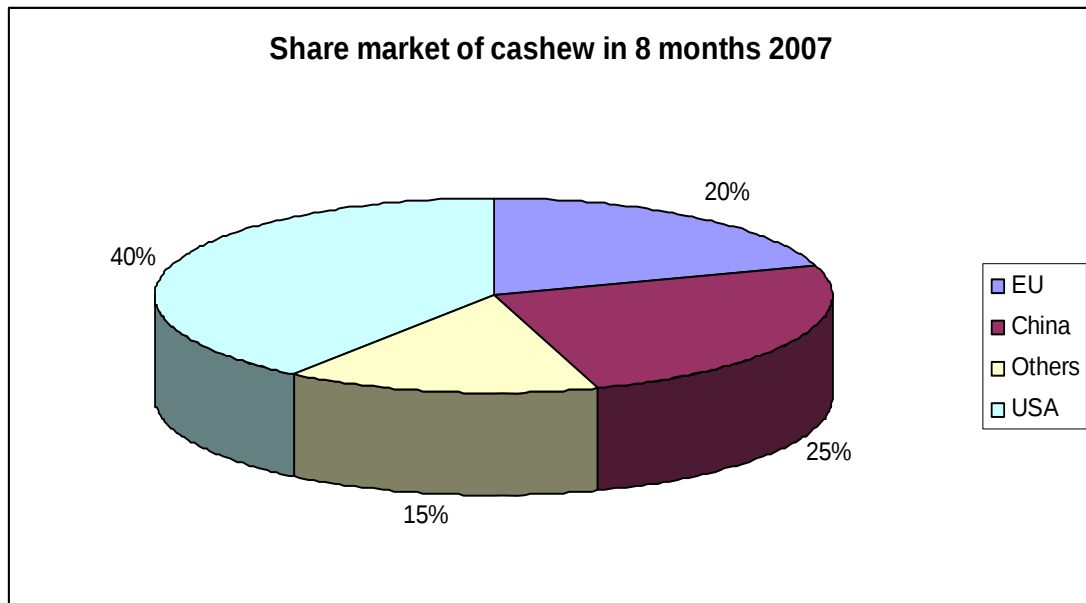
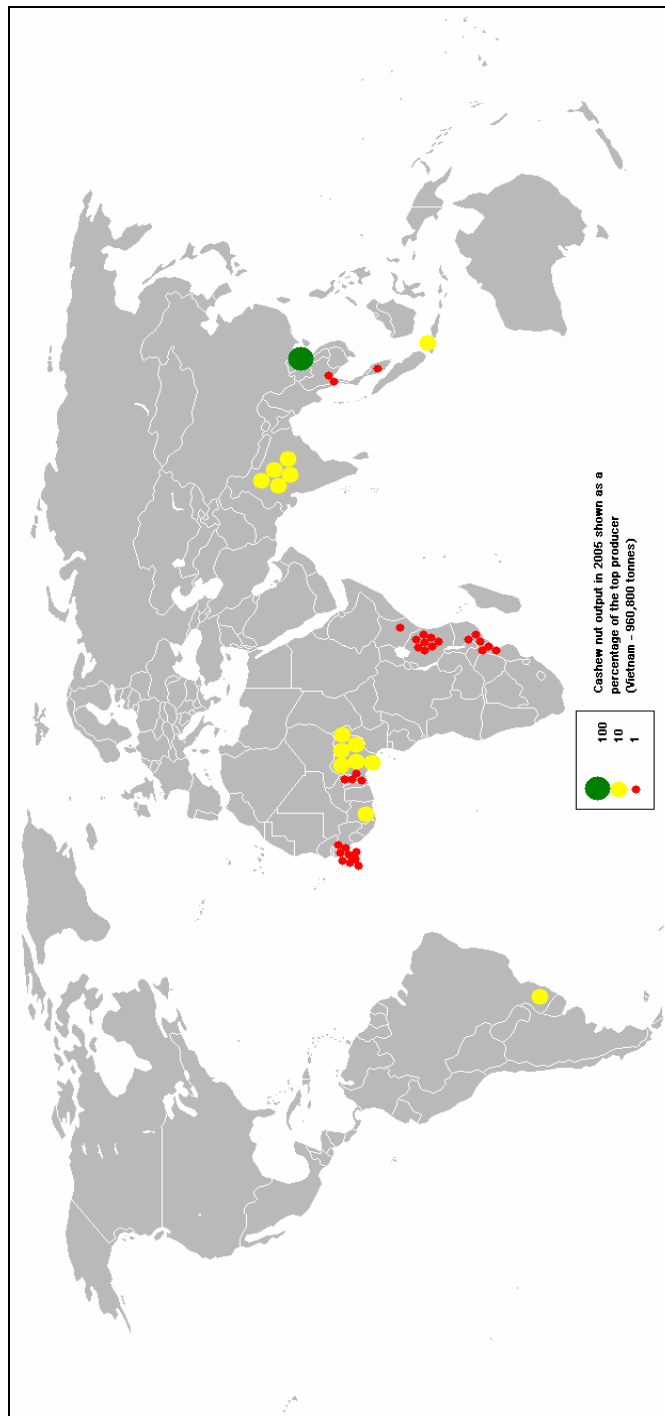


Figure 1.2a *The market shares of cashew export activities .*



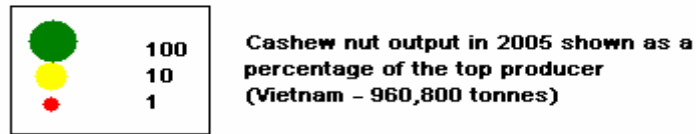


Figure 1.2a This [bubble map](#) shows the global distribution of cashew nut output in 2005 as a percentage of the top producer (Vietnam - 960,800 tonnes). (wikipedia)

Table 1.1 . The top ten cashew producers . (wikipedia)

Top Ten Cashew Producers — 2005				
Country	Production (Int \$1000)	Footnote	Production (t)	Footnote
 Vietnam	543,364	C	827,000	F
 India	302,234	C	460,000	F
 Brazil	165,091	C	251,268	
 Nigeria	139,947	C	213,000	F
 Indonesia	80,158	C	122,000	F
 Tanzania	65,703	C	100,000	F
 Côte d'Ivoire	59,133	C	90,000	F
 Guinea-Bissau	53,219	C	81,000	F
 Mozambique	38,108	C	58,000	F
 Benin	26,281	C	40,000	F
No symbol = official figure, F = FAO estimate, * = Unofficial figure, C = Calculated figure; Production in Int \$1000 have been calculated based on 1999-2001 international prices Source: Food And Agricultural Organization of United Nations: Economic And Social Department: The Statistical Division				

1.2 Material and products .

The cashew is a kind of family Anacardiaceae which is commonly planting in the northeastern of Brazil . It is now widely grown in tropical climate its cashew "nuts" and cashew apples. It is a small evergreen tree growing to 10m -12m tall, with a short, often irregularly-shaped trunk. The leaves are spirally arranged, leathery textured, elliptic to oblong, 4cm to 22 cm long and 2cm to 15 cm broad, with a smooth margin. (see figure 1.3) .The cashew fruit is abundant in vitamin A , C and phosphor . It is used to cure tonsillitis, dysentery and flu from using 100% of local material . Otherwise the Anacardic acid found in cashews have been used effectively in vivo against [tooth abscesses](#) due to their lethality to [gram-positive bacteria](#). They are also active against a wide range of other gram-positive bacteria.

- Culinary: The cashew is a popular snack, rich flavor and lightly salted . Cashews covered with chocolate are sold, but due to their higher price compared to peanuts and almonds are not as common in candy, except from higher quality manufacturers .



Figure 1.3 The plant physiological characteristics of cashew .

2. Organizing business plan .

Headquarter: 741 road, Long Hung commune, Phuoc Long suburban district, Binh Phuoc province.	
Field of operation	Purchasing and processing agri-products for export.
Trade mark	Thanh Binh
Quality standard control	ISO HACCP:DS 3027:2002
Target market	USA, China, European
Total capital (USD)	\$1,000,000
Primary product	Cashew nut
Form of investment	Capital distribution
Slogan	Quality first

2.1. Resource capital .

Total capital is 1,000,000USD including :

- 51% by owner of this business project approximately 510,000 USD
- 14 % by borrowing from the domestic bank system approximately 140,000 USD
- 35 % by mobilizing the potential investors approximately 350,000 USD.

2.2 Infrastructure .

- Building cashew processing manufactory with the cost of 60,000 USD .

See figure 2.1 . Production capacity 10,000 tons/per year.



Figure 2.1 *The cashew processing manufactory (sample)*

2.3. Land resource .

- Area: 10 hectares , Price: 60,000 USD /m2
- Tax: 0.2% , Total: 61,200 USD /m2 , Type: IV-IV precinct . See table 2.1

Table 2.1 . *The land price for lease .*

Urban types	Road types	Price of positions (VND/m ²)			
		I	II	III	IV
V	I	2.400.000	1.100.000	500.000	300.000
	II	1.650.000	630.000	300.000	200.000
	III	840.000	460.000	180.000	120.000
	IV	520.000	260.000	150.000	100.000

2.4. Human resource .

- Binh phuoc province has the big human resources . It is a new economic area with both skill and unskilled workers .- To reach the maximum profit in production we also have the special program in skill training to the employees .

Amount: 111 workers

Average salary: 13,327 USD/ month. Insurance: 5%. Medical: 5%. Total cost: 14,807 USD / month.

2.5. Machinery and equipment .

2.5.1 Oven machine .

Size: $L \times W \times H$ (meter) = $6 \times 3 \times 5$.- Capacity: 100 kilogram/period - Time: 2 minutes/ period.

Price: 100 USD/unit . - Amount: 20 units. - Total cost: 2,000 USD . See figure 2.2



Figure 2.2 *The oven processing machine (sample)*

2.5.2 Cashew nut automatic cracker machine .

- Price: 1,000 USD/ unit. - Amount: 25 units. - Total cost: 25,000 USD. - Capacity: 10->15 tons/a day (replacing for 400 workers) . See figure 2.3 .



Figure 2.3 *The cashew nut automatic cracker machinery*

2.5.3 Cashew nut automatic classifying machine .

- Price: 130 USD / unit. - Amount: 50 units. - - Total cost: 6,500 USD.

Size: $L \times W \times H$ (meter) = $7 \times 1,5 \times 2,5$. Capacity: 3,7Kw (5HP) - 380V - 50Hz.

- Property: classifying 5 kind of different cashew. See figure 2.4 .



Figure 2.4 *The cashew nut automatic classifying machine*

2.5.4 Cashew nut automatic packing machine

Price : 100 USD/unit , Amount : 30 units. Total cost : 3,000 USD . See figure 2.5 .

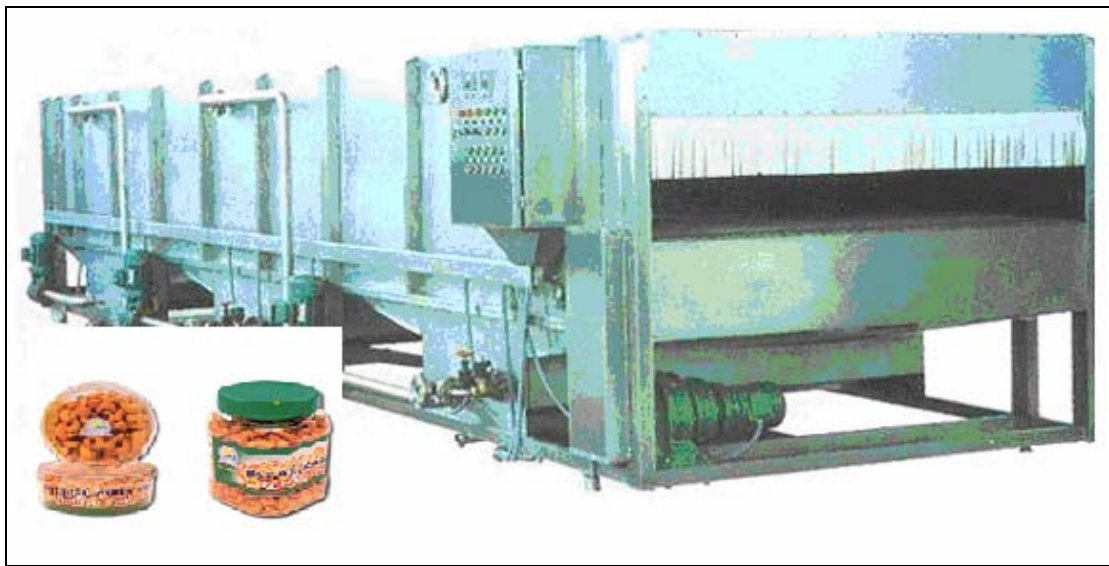


Figure 2.5 *The cashew nut automatic packing machine*

2.6. Business strategies .

Overview:

- Purchase and processing cashew, especially for secondary product.
- Keeping close control raw materials market.

- Setting up the domestic modern production line to replace foreign machinery.
- Focused on produce primitive products to export.
- Applying export and ISO standards for the processing and quality.

2.6.1 Product strategies .

- Producing 1,100 tons of cashew to export in a years.
- Selling price on the world market to export: 2,500 USD/ton.
- Purchasing 1,100 tons of raw materials.
- Buying price on the domestic market: 1,000 USD/ton.
- Producing 600 liter of acid from shaving of cashew.
- Selling price on the domestic market: 0.6USD/liter.

Primary products: Buttered-fried cashew nut , Salted-covered cashew nut .

See figure 2.6a and figure 2.6b



Figure 2.6a The primary product of cashew nut



Figure 2.6b A bottle of commercially produced cashew fruit juice

Some kinds of cashew used to export . See figure 2.7



Figure 2.7 The standard types of cashew nut for export .

2.6.2 Secondary product strategies .

General purpose :

Keeping close control of raw materials from big households and small agents through lending money and means of production to farmers . Agent and farmers will be under contract to supply raw material for production . Planning and supporting the competitive strategies to raise up the trade mark and revenue . Making the reduced expense for purchase raw material from the domestic market. Setting up an efficient result for business operation. Especially, the market at Binh Phuoc province has full potential for the development of cashew raw material. Notice that three secondary products are chemical fertilizer , insecticide and short-term credit fund .

a. Chemical fertilizer

(data from Hoang linh fertilizer agent)

Amount: 100 tons

- Average cost : 600 USD/ton
- Selling price + interest (interest rate 10%) .

Some kinds of chemical fertilizer:

DAP. KALI. NPK. UREA. ORGANIC fertilizer.

b. Insecticide .

- Amount: 700 liters.
- Average cost : USD2/liter.
- Average selling price + interest (interest rate 10%).

Types of insecticide .

METHINK 25 EC , CARADAN 5 H , CYPER ANPHA , ASITRIN 50 EC

c. Short-term credit fund

- Capital: USD70,000.

- Only apply to the households and small agents who will be under contract to supply raw material for production .
- Average interest rate : 10% annually
- Use the business co-operation contract form .

2.6.3 Marketing strategies .

- The purpose of marketing strategies is to establish customer awareness through name recognition while building a reputation of trust and loyalty in the mind of your customer. Marketing strategies is not as simple as creating a pretty logo, a fancy website or a prestigious office. It is a psychological issue. It exists in the minds of customers and prospect so your strategy should be developed with the total customer experience in mind.
- Designing website of company to advertise trade mark to customers and partners , Cost : 400 USD/year.
- Expanding the trade system in the domestic and export market through other distribution channels. Average cost: 3,000 USD/year
- Customer care service must be developed not only for quality but also for price to compete with other competitors through hiring the experts to analysis market. Average cost: 1,200 USD.
- Advertising the trade mark by the newspapers , radio , TV and others. Average cost: 120USD.

3. Result and evaluation .

3.1 Business result .

After operating business process , we would have estimated and proposed the following results .

3.1.1 The income statement . See table 3.1 .Table 3.1 *The income statement of quarter I , 2008*

Order	Item	Amount USD
Revenue		
1	Sale revenue	687,500
2	Other revenue	
3	Fund	19,250
4	Bank deposit	8,437
5	Chemical	16,637
6	Repellent , Insecticide	500
7	Acid	90
	Total	732,414
Expense		
1	Marketing	430
2	Secondary product	37,937
3	Machinery	4,885
4	Land	3,060
5	Infrastructure	3,000
6	HRM	44,421
7	Material	275,000
9	Operation cost	50,000

10	Interest	1,750
11	Income tax	183,103
	Total	603,516
Profit		128,898

3.1.2 The revenue statement . See table 3.2 and table 3.3 .

Table 3.2 *The revenue statement of quarter I , 2008*

Type	Amount	Unit	Selling price USD	Interest	Total USD	Quarter
				%		
Fund	17,500	USD		10	19,250	I
Bank deposit	30,000	USD		12,5	8,437	I
Chemical	25	ton	605	10	16,637	I
Insecticide	175	liter	2.6	10	500	I
Acid	150	liter	0.6		90	I
Cashew	275	ton	2,500		687,500	I
Total	USD 732,414					

Table 3.3 The revenue statement of quarter I , 2008 (in details)

Marketing	Time	Price	amount	\$1,720
Care service	Year			\$1,200
Website	Year			\$400
Distribute	Year			\$3,000
Advertise	Year			\$120
Discount	Quarter I	\$143.3333	3 months	<u>\$430</u>
Secondary product				\$151,750
Credit fund	Year	10%		\$70,000
Repellent	Year	\$2/liter	700 liter	\$1,400
Chemical fertilizer	Year	\$600/ton	100 ton	\$60,000
Expense	Quarter I	\$12,645	3 months	<u>\$37,937</u>
Machinery				\$97,700
package	5 years	\$100	30	\$3,000
Classify	5 years	\$130	50	\$6,500
Oven	5 years	\$100	20	\$2,000
Automatic	5 years	\$1,000	25	\$25,000
Cycle life	5 years		60 months	
Discount	Quarter I	\$1,628	3 months	<u>\$4,885</u>
Land		Tax	\$1,200	\$61,200
Cycle life	5 years	10 hectare	60,000	
Discount	Quarter I	\$1,020	3 months	<u>\$3,060</u>
infrastructure				\$60,000
Cycle life	5 years			
Discount	Quarter I	\$1,000	3 months	<u>\$3,000</u>
HRM				
Insurance	month	\$740	144	
Medical	Month	\$740	144	
Worker	month	\$13,327	144	
expense	Quarter I	\$14,807	3 months	<u>\$44,421</u>
Material				\$550,000
Cycle life	1year	\$1,000	1,100ton	
Expense	Quarter I	275 ton	3 months	<u>\$275,000</u>
Operation cost				<u>\$50,000</u>
Income tax				<u>\$183,103</u>
Bank interest				<u>\$1,680</u>

3.1.3 The balance sheet . See table 3.4 .

Table 3.4 *The balance sheet of quarter I , 2008 (in details)*

Order	Content	Balance USD
SHORT-TERM ASSET		617,880
1	Cash	8,980
2	Bank deposit	30,000
3	Short-term invest	61,750
4	Inventory	517,150
LONG-TERM ASSET		382,120
	Fixed asset	
1	Tangible asset	218,900
2	Intangibles asset	163,220
	TOTAL ASSET	1,000,000
OWNER'S EQUITY		
	Funds	50,000
	Capital invest	890,000
	Capital to invest frastructure	60,000
TOTAL EQUITY		1,000,000

3.1.4 The payroll statement . See table 3.5 and table 3.6 .


```
[[0,8,8,8,8,8,0],[0,8,8,8,8,8,0],[0,8,8,8,8,8,0],[0,8,8,8,8,8,0],
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  [0,8,8,8,8,8,0],[0,8,8,8,8,8,0],[0,8,8,8,8,8,0],[0,8,8,8,8,8,0],
  [0,8,8,8,8,8,0],[0,8,8,8,8,8,0],[0,8,8,8,8,8,0],[0,8,8,8,8,8,0],
  [0,8,8,8,8,8,0]]
```

INPUT DATA Number of data input: 17 THANHBINH.LTD.Co QUARTER I

Table 3.6 *The payroll statement of quarter I , 2008 (using maple worksheet)*

PAYROLL LEDGER		HOURS WORKED							TOTAL HOURS	RATE	GROSS EARNINGS
Index	EMPLOYEE'S NAME	Sun	M	T	W	Th	F	Sat			
1	Managerdir	0	8	8	8	8	8	0	40.00	2.60	104.00
2	Foreman	0	8	8	8	8	8	0	40.00	2.00	80.00
3	Chiefaccou	0	8	8	8	8	8	0	40.00	1.50	60.00
4	Bookkeeper	0	8	8	8	8	8	0	40.00	1.00	40.00
5	ChiefHRM	0	8	8	8	8	8	0	40.00	1.60	64.00
6	Chiefengne	0	8	8	8	8	8	0	40.00	1.50	60.00
7	Law	0	4	4	4	4	4	0	20.00	2.50	50.00
8	Chiefbussi	0	8	8	8	8	8	0	40.00	1.70	68.00
9	Secretary	0	8	8	8	8	8	0	40.00	.80	32.00
10	Cashier	0	8	8	8	8	8	0	40.00	.80	32.00
11	Doorkeeper	0	8	8	8	8	8	0	40.00	.63	25.00
12	Truckdrive	0	8	8	8	8	8	0	40.00	.75	30.00
13	Chiefshop	0	8	8	8	8	8	0	40.00	1.20	48.00
14	Longshorem	0	8	8	8	8	8	0	40.00	.75	30.00
15	Saleperson	0	8	8	8	8	8	0	40.00	.70	28.00
16	Teamleader	0	8	8	8	8	8	0	40.00	.90	36.00
17	Worker	0	8	8	8	8	8	0	40.00	.60	24.00
Total of employees' gross earnings :										"	$\sum_{k=1}^{17} T_k = 811.000$
AMOUNT OF THIS PAYROLL LEDGER : \$										:	

3.2 Evaluation .

3.2.1 Break even of the business plan .

Use maple worksheet to calculate the break even of our business plan.

Total cost : USD1,000,000 / year .

Operating expenses : USD201,172 / month

The break even value : USD1,201,200 i.e USD100,100 / month

> **break_even(1000000,[OPERATING_EXPENSES,20.12],BREAK_EVEN);**

INPUT DATA

The data inputs given:

[COST, OPERATING_EXPENSES, BREAK_EVEN] =
[1000000, [OPERATING_EXPENSES, 20.12], BREAK_EVEN]

" \$ ", COST = 1000000

" \$ ", OPERATING_EXPENSES = [OPERATING_EXPENSES, 20.12]

" \$ ", BREAK_EVEN = BREAK_EVEN

" OPERATING_EXPENSES : (OE) \$ = " , 201200.0000

" BREAK-EVEN = COST + OPERATING_EXPENSES (\$) " , 0.12012 10⁷

3.2.2 Growth rate of business activity .

- Growth rate is the measure of annually development in business activities .To form a program and orientation in the future , we use the online tools *financial calculator* to find the growth rate after one year

(source : <http://ncumathdeptvie.page.tl/TOOLS.htm>) . Suppose the present value is \$2,414,064 and the future value desired after one year is \$2,929,656 .

Present value: \$2,414,064/year

Future value: \$2,929,656/year.

It shows that the growth rate is : 21.36% . See table 3.7 .

Thus, the average growth rate in each quarter can be approximately 5.34 %

Table 3.7 *The growth rate prediction calculated by financial calculator .*

Present Value:	USD	2,414,064.0
Future Value:	USD	2,929,656.0
Years to Grow:	Y	1
Growth Rate:	%	21.36 %

3.2.3 Modeling the growth rate .

From the data above with the difference of percentage of development in other quarters , we use the software Curve Expert version 1.3 to sketch the best-fitted line that models growth rate of our business project. See table 3.8 .

Table 3.8 *The average data predicted for modeling the growth rate .*

X (month)		3		6		9		12	
Y (%)		5.34 ± 0.35		10.68 ± 0.45		16.02 ± 0.15		21.36 ± 0.05	
3	4.99	3	5.34	3	5.69				
6	10.23	6	10.68	6	11.13				
9	15.87	9	16.02	9	16.17				
12	21.31	12	21.36	12	21.41				

Followings are the mathematical models obtained from the calculation

1/. *Gaussian Model:* $y=a*\exp((-b-x)^2)/(2*c^2))$. See figure 3.1 .

Coefficient Data:

a = 23.457081 b = 15.1306 c = 7.1406832

Covariance Matrix:

6.5080634	4.8670374	2.4788269
4.8670374	3.8939253	2.0635343
2.4788269	2.0635343	1.1414746

Standard Error: 0.3756401

Correlation Coefficient: 0.9985168

Comments:

The fit converged to a tolerance of 1e-006 in 4 iterations. No weighting used.

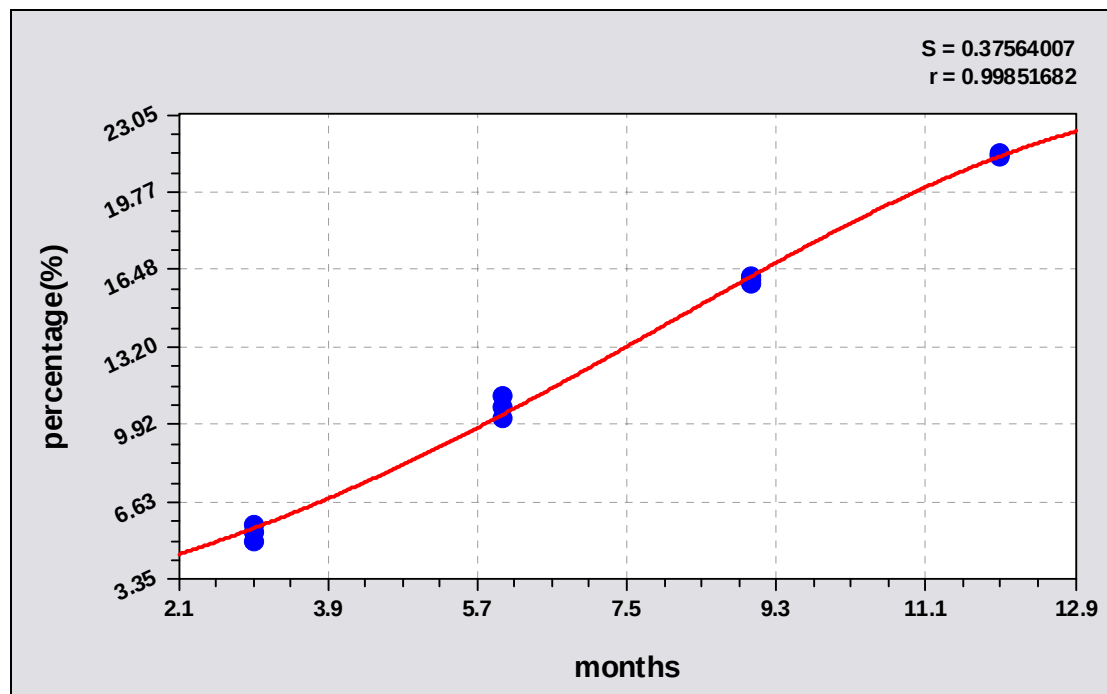


Figure 3.1 The graph of Gauss model .

2/. Gompertz Relation: $y = a \cdot \exp(-\exp(b - cx))$. See figure 3.2 .

Coefficient Data:

a = 35.308722 b = 1.066023 c = 0.14580968

Covariance Matrix:

75.315576 -0.15206396 -0.34322527
 -0.15206396 0.0046599034 0.0011847422
 -0.34322527 0.0011847422 0.0016288572

Standard Error: 0.3082340 Correlation Coefficient: 0.9990016

Comments:

The fit converged to a tolerance of 1e-006 in 4 iterations. No weighting used.

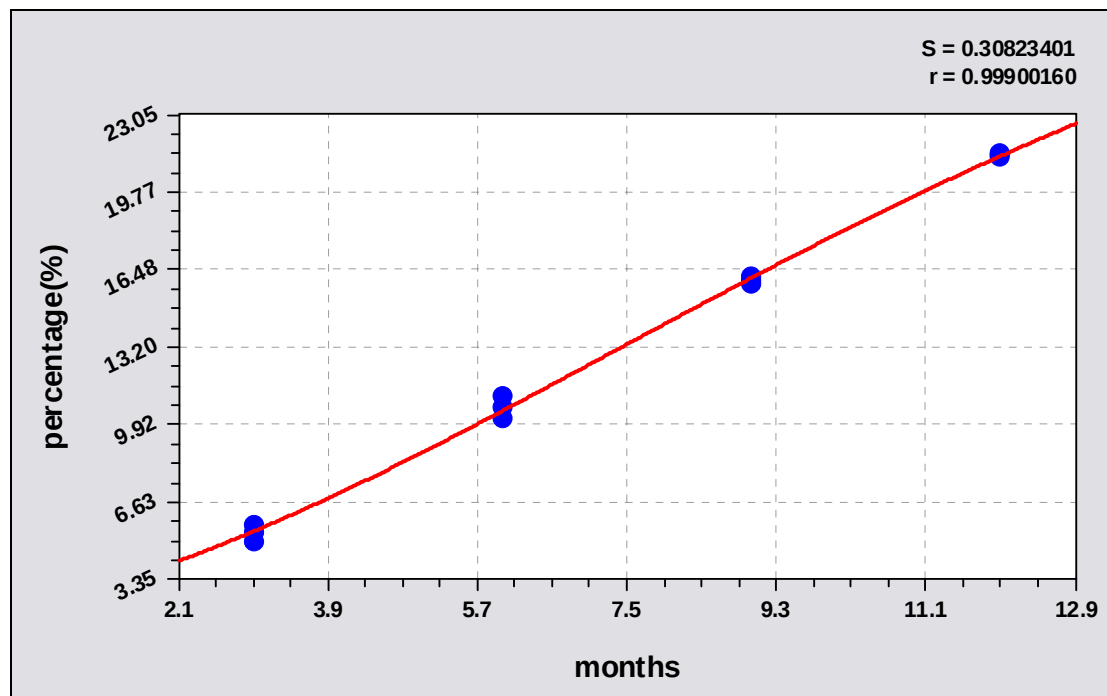


Figure 3.2 The graph of Gompertz model .

3/. Logarithm Fit: $y=a+b*\ln(x)$. See figure 3.3 .

Coefficient Data:

$$a = -7.9292877 \quad b = 11.240293$$

Covariance Matrix:

$$\begin{array}{cc} 1.1851904 & -0.58203058 \\ -0.58203058 & 0.30744423 \end{array}$$

Standard Error: 1.3222735 *Correlation Coefficient:* 0.9793828

Comments:

The fit converged to a tolerance of 1e-006 in 3 iterations. No weighting used.

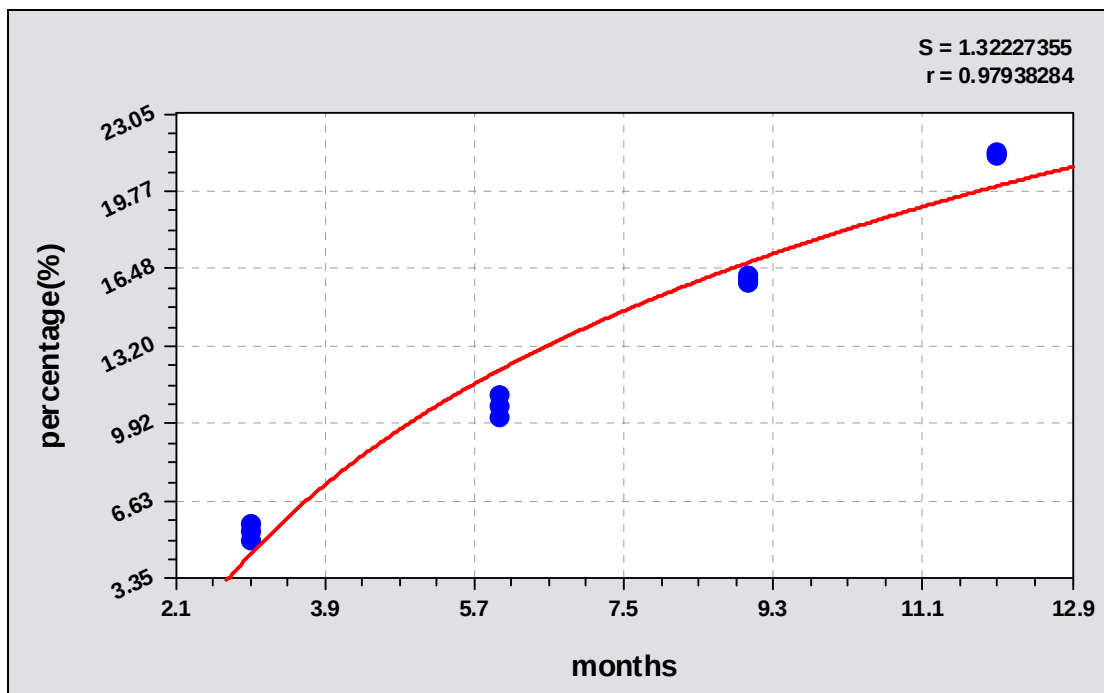


Figure 3.3 The graph of Logarithm model .

4/. Modified Power: $y=a*b^x$. See figure 3.4 .

Coefficient Data:

$$a = 4.5990792 \quad b = 1.1392202$$

Covariance Matrix:

0.12557325 -0.0028995459
 -0.0028995459 7.1679855e-005

Standard Error: 1.1584182 Correlation Coefficient: 0.9842145

Comments:

The fit converged to a tolerance of 1e-006 in 5 iterations. No weighting used.

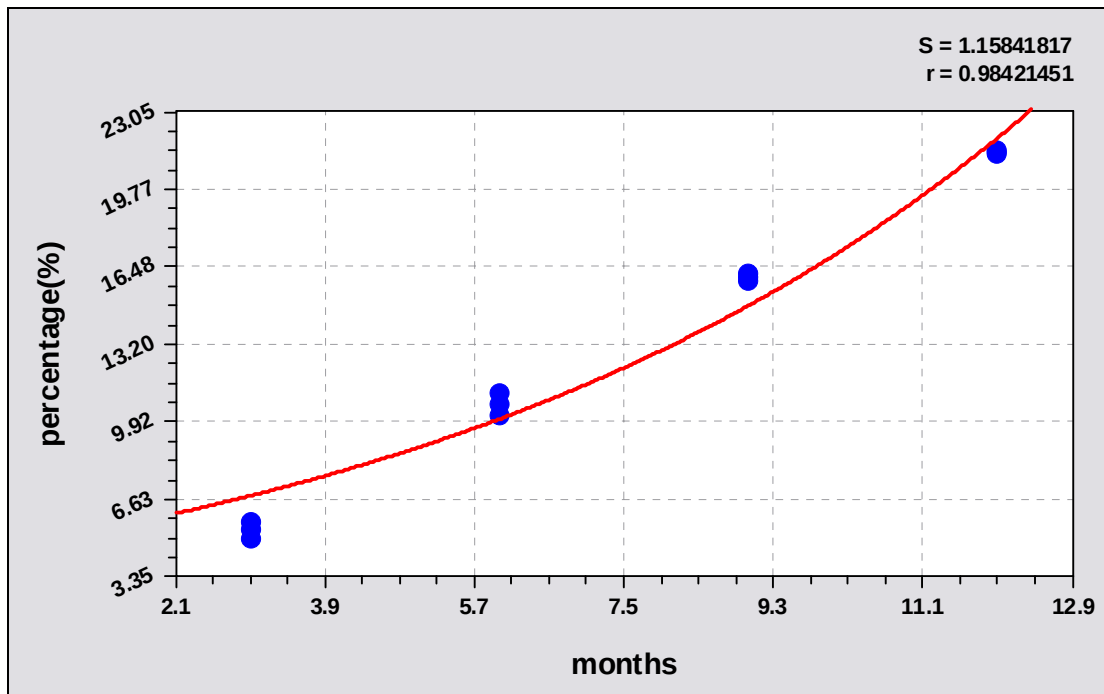


Figure 3.4 The graph of Modified Power model .

5/. Hyperbolic Fit: $y=a+b/x$. See figure 3.5 .

Coefficient Data:

a = 23.276923 b = -57.179077

Covariance Matrix:

0.35042735 -1.5384615
 -1.5384615 8.8615385

Standard Error: 2.4389753 Correlation Coefficient: 0.9279843

Comments:

The fit converged to a tolerance of 1e-006 in 2 iterations. No weighting used.

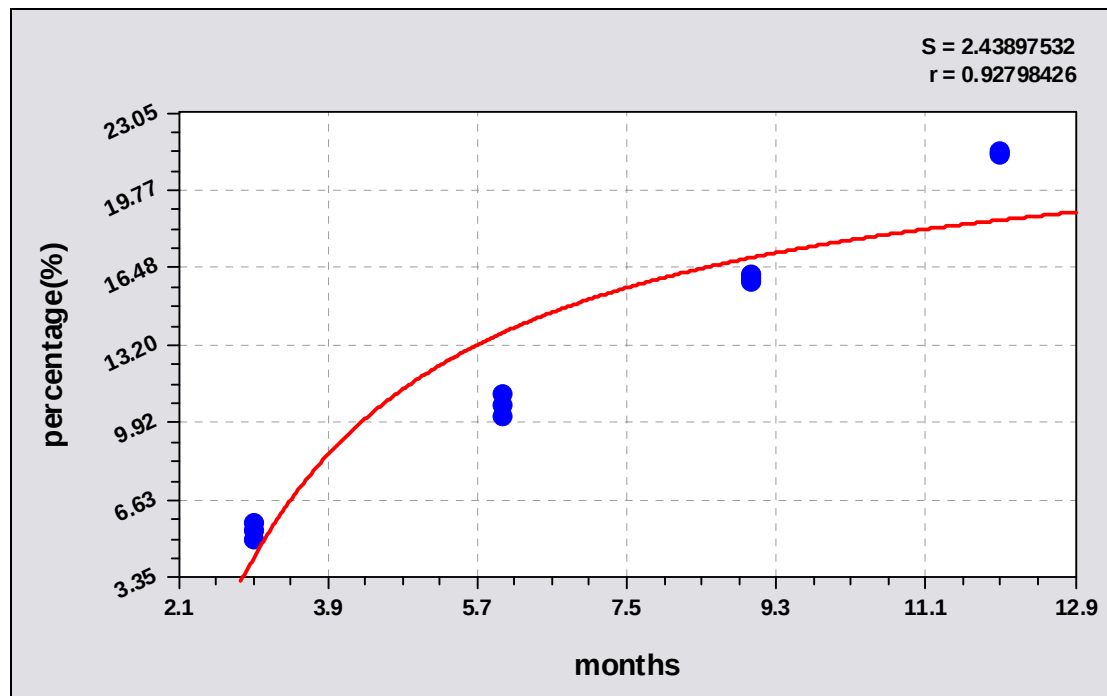


Figure 3.5 The graph of Hyperbolic model .

3.2.4 The growth rate prediction .

To predict the growth rate of our business plan , after using the software Curve Expert to find the best-fitted curves that model the data from hypothesis , we make an estimation by graphing these functions on the same axes and determine which values would be best for each quarter (see figure 3.6) . Following is the growth rates in quarter I obtained from five mathematical models above . (see table 3.9)

Table 3.9 The growth rates obtained from mathematical models .

Mathematical model		Gauss	Gompertz	Logarith	ModPow	Hyperbolic
Quarter I	Rate %	5.541	5.415	4.419	6.800	4.217

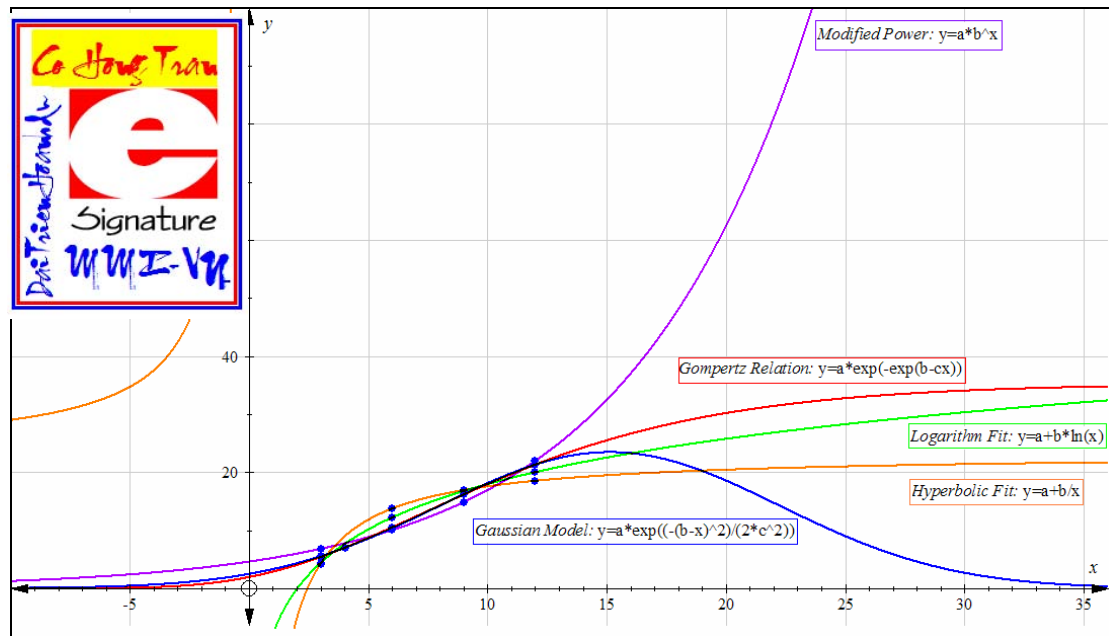


Figure 3.5 The graphs of mathematical models . Use Graphing Package.

Substituting 3 for x in the models *Gauss* , *Gompertz* , *logarithm* , *modified power* and *hyperbolic fit* gives the data in table 3.9 . Using software ESBSStats it follows the statistic estimation for the mean , variance and standard deviation after processing the raw data denoted by GR3 (abbreviation of growth rate in the first quarter) . See figure 3.6 .

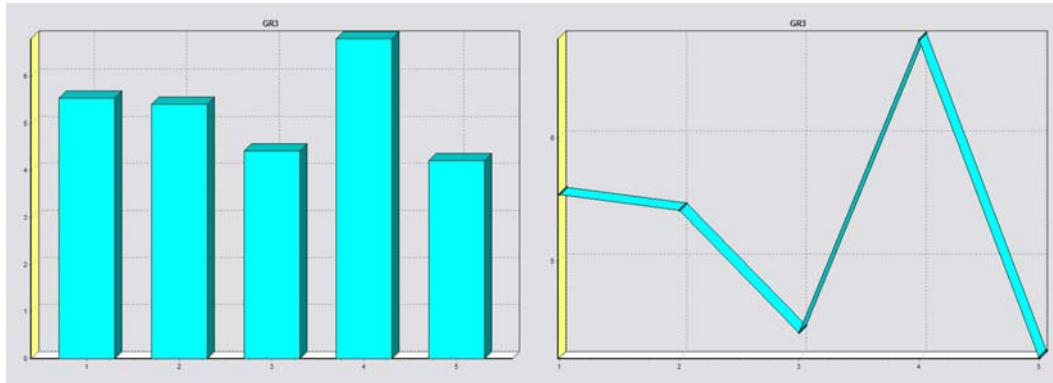


Figure 3.6 The bar graph and line graph of GR3 .

a . Statistical Summary for GR3

Data Collection is for a Sample with Data supplied as Raw Data (5 values).

Measures of Centrality

Mean: 5.2784 , Median: 5.4150 , Mode: N/A

Measures of Dispersion

Range: $6.8000 - 4.2170 = 2.5830$, InterQuartile Range: $5.8558 - 4.3685 = 1.4873$

10-90 Percentile Range: $6.8000 - 4.2170 = 2.5830$

Mean Deviation: 0.0000 , Variance: 1.0670 , Standard Deviation: 1.0330

Relative Dispersion

Coefficient of Variation: 0.1957 , Quartile Coefficient of Variation: 0.1455

b. Statistical Inference for GR3

Sample Mean: 5.2784 , Sample Standard Deviation: 1.033 , Number of Values: 5

Interval Estimate for the Mean of GR3

Confidence Level: 95.0000%

It is estimated that the mean number of units lies somewhere between 3.9958 units and 6.5610 units.

Interval Estimate for the Variance of GR3

Confidence Level: 95.0000%

It is estimated that the Variance lies somewhere between 0.3830 units sq and 8.8106 units sq.

c. Proportional Statistical Inference for GR3

Number of Values: 5 , Sample Proportion, $p : 0 \text{ of } 5 = 0.0$, Sample Complement, $q: 5 \text{ of } 5 = 1.0000$

*d. Interval Estimate for the Proportion of GR3 . Confidence Level: 95.0000%***3.2.5 Markup based on cost .**

- Markup: The difference between the Cost per item and the Selling Price. Markup based on Cost is expressed as a percent of cost, i.e $\text{Cost \%} = 100\%$. Thus Markup and Selling Price have the amount based on the Cost value.

Assume that the cost of 1 ton of cashew is USD1000 and its selling price is USD2,500. Find the percent of Markup and Selling price.

$$C(\text{COST.\%,\$}) + M(\text{MARKUP.\%,\$}) = SP(\text{SELLING PRICE.\%,\$})$$

Use maple worksheet to calculate markup based on cost for 1 ton of cashew, we obtain:

Markup of a ton= USD 1500

Toatal production : 275 ton/quarter

Total markup = USD 412,500/quarter

> **end: markup_based_on_cost_VALUE(1000,0,2500);**

INPUT DATA

The data inputs given:

[*COST, MARKUP, SELLING_PRICE*] = [1000, 0, 2500]

" \$ ", $COST = 1000$ " \$ ", $MARKUP = 0$ " \$ ", $SELLING_PRICE = 2500$

" $MARKUP = SELLING_PRICE - COST$

" $MARKUP = \$, 1500$

" percent of $MARKUP = , \frac{3}{2}, "$ or % ", 150.

" $SELLING_PRICE = \$, 2500$

" percent of $SELLING_PRICE = , \frac{5}{2}, "$ or % ", 250.

3.2.6 Simple interest of credit fund .

Simple Interest = Principal $\times$ Rate $\times$ Time

Using maple worksheet to calculate the simple interest of credit fund that is about USD43.75 in each quarter i.e the maturity is USD17543.75 approximately per year.

> **Maturity (17500, 0.01, 3/12);**

Principal = 17500, dollars

Rate = .01 Time = $\frac{1}{4}$, year

Simple_Interest = Principal $\times$ Rate $\times$ Time

Simple_Interest = 43.75000, dollars

Maturity_Value = Principal + Interest

Maturity_Value = 17543.75, dollars

4. Conclusion .

By the total revenue that comes from selling the primary and secondary products in the domestic and export market , we are able to obtain USD 2,929,656 annually or USD 732,414 quarterly (see table 3.2) . The total cost is USD2,414,064 annually or USD603,516 quarterly . The profit that we will obtain annually is a reasonable value , so in the next two years we can regain the total capital invested . The average profit is USD128,898 quarterly (see table 3.1). The growth rate is about 21.63% annually , and the confidence level is 95.00% from statistic processing .

The data after considering shows that the business plan is within the bounds of possibility and reality . The cashew export activity of Vietnam takes the first position in the world and the average output of cashew to export is increasing convincibly . These are noticeable advantages for cashew production and export activities in the future.

